Extron® Electronics

INTERFACING, SWITCHING AND DISTRIBUTION

Setup Guide

MTPX Plus Series

Mini Twisted Pair Matrix Switchers

68-1560-01 **Rev. A**
06 08

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Precautions

Safety Instructions • English

This symbol is intended to alert the user of important operating and maintenance (servicing) instructions in the literature provided with the equipment.

This symbol is intended to alert the user of the presence of uninsulated dangerous voltage within the product's enclosure that may present a risk of electric shock.

Caution

Read Instructions • Read and understand all safety and operating instructions before using the equipment.

Retain Instructions • The safety instructions should be kept for future reference.

Follow Warnings • Follow all warnings and instructions marked on the equipment or in the user information.

Avoid Attachments • Do not use tools or attachments that are not recommended by the equipment manufacturer because they may be hazardous.

Consignes de Sécurité • Français

Ce symbole sert à avertir l'utilisateur que la documentation fournie avec le matériel contient des instructions importantes concernant l'exploitation et la maintenance (réparation).

Ce symbole sert à avertir l'utilisateur de la présence dans le boîtier de l'appareil de tensions dangereuses non isolées posant des risques d'électrocution.

Attention

Lire les instructions• Prendre connaissance de toutes les consignes de sécurité et d'exploitation avant d'utiliser le matériel.

Conserver les instructions• Ranger les consignes de sécurité afin de pouvoir les consulter à l'avenir.

Respecter les avertissements • Observer tous les avertissements et consignes marqués sur le matériel ou présentés dans la documentation utilisateur.

Eviter les pièces de fixation • Ne pas utiliser de pièces de fixation ni d'outils non recommandés par le fabricant du matériel car cela risquerait de poser certains dangers.

Sicherheitsanleitungen • Deutsch

Dieses Symbol soll dem Benutzer in der im Lieferumfang enthaltenen Dokumentation besonders wichtige Hinweise zur Bedienung und Wartung (Instandhaltung) geben.

Dieses Symbol soll den Benutzer darauf aufmerksam machen, daß im Inneren des Gehäuses dieses Produktes gefährliche Spannungen, die nicht isoliert sind und die einen elektrischen Schock verursachen können, herrschen.

Achtung

Lesen der Anleitungen • Bevor Sie das Gerät zum ersten Mal verwenden, sollten Sie alle Sicherheits-und Bedienungsanleitungen genau durchlesen und verstehen.

Aufbewahren der Anleitungen • Die Hinweise zur elektrischen Sicherheit des Produktes sollten Sie aufbewahren, damit Sie im Bedarfsfall darauf zurückgreifen können.

Befolgen der Warnhinweise • Befolgen Sie alle Warnhinweise und Anleitungen auf dem Gerät oder in der Benutzerdokumentation.

Keine Zusatzgeräte • Verwenden Sie keine Werkzeuge oder Zusatzgeräte, die nicht ausdrücklich vom Hersteller empfohlen wurden, da diese eine Gefahrenquelle darstellen können.

Instrucciones de seguridad • Español

Este símbolo se utiliza para advertir al usuario sobre instrucciones importantes de operación y mantenimiento (o cambio de partes) que se desean destacar en el contenido de la documentación suministrada con los equipos.

Este símbolo se utiliza para advertir al usuario sobre la presencia de elementos con voltaje peligroso sin protección aislante, que puedan encontrarse dentro de la caja o alojamiento del producto, y que puedan representar riesgo de electrocución.

Precaucion

Leer las instrucciones • Leer y analizar todas las instrucciones de operación y seguridad, antes de usar el equipo.

Conservar las instrucciones • Conservar las instrucciones de seguridad para futura consulta.

Obedecer las advertencias • Todas las advertencias e instrucciones marcadas en el equipo o en la documentación del usuario, deben ser obedecidas.

Evitar el uso de accesorios • No usar herramientas o accesorios que no sean especificamente recomendados por el fabricante, ya que podrian implicar riesgos.

Warning

Power sources • This equipment should be operated only from the power source indicated on the product. This equipment is intended to be used with a main power system with a grounded (neutral) conductor. The third (grounding) pin is a safety feature, do not attempt to bypass or disable it.

Power disconnection • To remove power from the equipment safely, remove all power cords from the rear of the equipment, or the desktop power module (if detachable), or from the power source receptacle (wall plug).

Power cord protection • Power cords should be routed so that they are not likely to be stepped on or pinched by items placed upon or against them.

Servicing • Refer all servicing to qualified service personnel. There are no user-serviceable parts inside. To prevent the risk of shock, do not attempt to service this equipment yourself because opening or removing covers may expose you to dangerous voltage or other hazards.

Slots and openings • If the equipment has slots or holes in the enclosure, these are provided to prevent overheating of sensitive components inside. These openings must never be blocked by other objects.

Lithium battery • There is a danger of explosion if battery is incorrectly replaced. Replace it only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Avertissement

Alimentations• Ne faire fonctionner ce matériel qu'avec la source d'alimentation indiquée sur l'appareil. Ce matériel doit être utilisé avec une alimentation principale comportant un fil de terre (neutre). Le troisième contact (de mise à la terre) constitue un dispositif de sécurité : n'essayez pas de la contourner ni de la désactiver.

Déconnexion de l'alimentation• Pour mettre le matériel hors tension sans danger, déconnectez tous les cordons d'alimentation de l'arrière de l'appareil ou du module d'alimentation de bureau (s'il est amovible) ou encore de la prise secteur.

Protection du cordon d'alimentation • Acheminer les cordons d'alimentation de manière à ce que personne ne risque de marcher dessus et à ce qu'ils ne soient pas écrasés ou pincés par des objets.

Réparation-maintenance • Faire exécuter toutes les interventions de réparation-maintenance par un technicien qualifié. Aucun des éléments internes ne peut être réparé par l'utilisateur. Afin d'éviter tout danger d'électrocution, l'utilisateur ne doit pas essayer de procéder lui-même à ces opérations car l'ouverture ou le retrait des couvercles risquent de l'exposer à de hautes tensions et autres dangers.

Fentes et orifices • Si le boîtier de l'appareil comporte des fentes ou des orifices, ceux-ci servent à empêcher les composants internes sensibles de surchauffer. Ces ouvertures ne doivent jamais être bloquées par des objets.

Lithium Batterie • Il a danger d'explosion s'll y a remplacment incorrect de la batterie. Remplacer uniquement avec une batterie du meme type ou d'un ype equivalent recommande par le constructeur. Mettre au reut les batteries usagees conformement aux instructions du fabricant.

Vorsicht

Stromquellen • Dieses Gerät sollte nur über die auf dem Produkt angegebene Stromquelle betrieben werden. Dieses Gerät wurde für eine Verwendung mit einer Hauptstromleitung mit einem geerdeten (neutralen) Leiter konzipiert. Der dritte Kontakt ist für einen Erdanschluß, und stellt eine Sicherheitsfunktion dar. Diese sollte nicht umgangen oder außer Betrieb gesetzt werden.

Stromunterbrechung • Um das Gerät auf sichere Weise vom Netz zu trennen, sollten Sie alle Netzkabel aus der Rückseite des Gerätes, aus der externen Stomversorgung (falls dies möglich ist) oder aus der Wandsteckdose ziehen.

Schutz des Netzkabels • Netzkabel sollten stets so verlegt werden, daß sie nicht im Weg liegen und niemand darauf treten kann oder Objekte darauf- oder unmittelbar dagegengestellt werden können.

Wartung • Alle Wartungsmaßnahmen sollten nur von qualifiziertem Servicepersonal durchgeführt werden. Die internen Komponenten des Gerätes sind wartungsfrei. Zur Vermeidung eines elektrischen Schocks versuchen Sie in keinem Fall, dieses Gerät selbst öffnen, da beim Entfernen der Abdeckungen die Gefahr eines elektrischen Schlags und/oder andere Gefahren bestehen.

Schlitze und Öffnungen • Wenn das Gerät Schlitze oder Löcher im Gehäuse aufweist, dienen diese zur Vermeidung einer Überhitzung der empfindlichen Teile im Inneren. Diese Öffnungen dürfen niemals von anderen Öbjekten blockiert werden.

Litium-Batterie • Explosionsgefahr, falls die Batterie nicht richtig ersetzt wird. Ersetzen Sie verbrauchte Batterien nur durch den gleichen oder einen vergleichbaren Batterietyp, der auch vom Hersteller empfohlen wird. Entsorgen Sie verbrauchte Batterien bitte gemäß den Herstelleranweisungen.

Advertencia

Alimentación eléctrica • Este equipo debe conectarse únicamente a la fuente/tipo de alimentación eléctrica indicada en el mismo. La alimentación eléctrica de este equipo debe provenir de un sistema de distribución general con conductor neutro a tierra. La tercera pata (puesta a tierra) es una medida de seguridad, no puentearia ni eliminaria.

Desconexión de alimentación eléctrica • Para desconectar con seguridad la acometida de alimentación eléctrica al equipo, desenchufar todos los cables de alimentación en el panel trasero del equipo, o desenchufar el módulo de alimentación (si fuera independiente), o desenchufar el cable del receptáculo de la pared.

Protección del cables de alimentación • Los cables de alimentación eléctrica se deben instalar en lugares donde no sean pisados ni apretados por objetos que se puedan apoyar sobre ellos.

Reparaciones/mantenimiento • Solicitar siempre los servicios técnicos de personal calificado. En el interior no hay partes a las que el usuario deba acceder. Para evitar riesgo de electrocución, no intentar personalmente la reparación/mantenimiento de este equipo, ya que al abrir o extraer las tapas puede quedar expuesto a voltajes peligrosos u otros riesgos.

Ranuras y aberturas • Si el equipo posee ranuras o orificios en su caja/alojamiento, es para evitar el sobrecalientamiento de componentes internos sensibles. Estas aberturas nunca se deben obstruir con otros objetos.

Batería de litio • Existe riesgo de explosión si esta batería se coloca en la posición incorrecta. Cambiar esta batería únicamente con el mismo tipo (o su equivalente) recomendado por el fabricante. Desachar las baterías usadas siguiendo las instrucciones del fabricante.

Extron's Warranty

Extron Electronics warrants this product against defects in materials and workmanship for a period of three years from the date of purchase. In the event of malfunction during the warranty period attributable directly to faulty workmanship and/or materials, Extron Electronics will, at its option, repair or replace said products or components, to whatever extent it shall deem necessary to restore said product to proper operating condition, provided that it is returned within the warranty period, with proof of purchase and description of malfunction to:

USA, Canada, South America, and Central America:

Extron Electronics
1001 East Ball Road
Anaheim, CA 92805, USA

Asia:
Extron Electronics, Asia
135 Joo Seng Road, #04-01
PM Industrial Bldg.
Singapore 368363

Europe, Africa, and the Middle East:

Extron Electronics, Europe
Beeldschermweg 6C
3821 AH Amersfoort
The Netherlands

Japan:
Extron Electronics, Japan
Kyodo Building
16 Ichibancho
Chiyoda-ku, Tokyo 102-0082
Japan

This Limited Warranty does not apply if the fault has been caused by misuse, improper handling care, electrical or mechanical abuse, abnormal operating conditions or non-Extron authorized modification to the product.

If it has been determined that the product is defective, please call Extron and ask for an Applications Engineer at (714) 491-1500 (USA), 31.33.453.4040 (Europe), 65.6383.4400 (Asia), or 81.3.3511.7655 (Japan) to receive an RA# (Return Authorization number). This will begin the repair process as quickly as possible.

Units must be returned insured, with shipping charges prepaid. If not insured, you assume the risk of loss or damage during shipment. Returned units must include the serial number and a description of the problem, as well as the name of the person to contact in case there are any questions.

Extron Electronics makes no further warranties either expressed or implied with respect to the product and its quality, performance, merchantability, or fitness for any particular use. In no event will Extron Electronics be liable for direct, indirect, or consequential damages resulting from any defect in this product even if Extron Electronics has been advised of such damage.

Please note that laws vary from state to state and country to country, and that some provisions of this warranty may not apply to you.

安全须知 • 中文

这个符号提示用户该设备用户手册中有重要的操作和维护说明。

这个符号警告用户该设备机壳内有暴露的危险电压，有触电危险。

注意

阅读说明书 • 用户使用该设备前必须阅读并理解所有安全和使用说明。

保存说明书 • 用户应保存安全说明书以备将来使用。

遵守警告 • 用户应遵守产品和用户指南上的所有安全和操作说明。

避免追加 • 不要使用该产品厂商没有推荐的工具或追加设备，以避免危险。

警告

电源 • 该设备只能使用产品上标明的电源。 设备必须使用有地线的供电系统供电。 第三条线（地线）是安全设施，不能不用或跳过。

拔掉电源 • 为安全地从设备拔掉电源，请拔掉所有设备后或桌面电源的电源线，或任何接到市电系统的电源线。

电源线保护 • 妥善布线， 避免被踩踏，或重物挤压。

维护 • 所有维修必须由认证的维修人员进行。 设备内部没有用户可以更换的零件。为避免出现触电危险不要自己试图打开设备盖子维修该设备。

通风孔 • 有些设备机壳上有通风槽或孔，它们是用来防止机内敏感元件过热。 不要用任何东西挡住通风孔。

锂电池 • 不正确的更换电池会有爆炸的危险。 必须使用与厂家推荐的相同或相近型号的电池。 按照生产厂的建议处理废弃电池。

FCC Class A Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. Front Panel Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation. The Class A limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Front Panel Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user will be required to correct the interference at his own expense.

NOTE *This unit was tested with shielded cables on the peripheral devices. Shielded cables must be used with the unit to ensure compliance with FCC emissions limits.*

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Chapter One

Introduction

About this Manual

About the MTPX Plus Switchers

Twisted Pair (TP) Cable Transmision Distance

TP Skew Equalization

About this Manual

This setup guide allows you to easily and quickly set up and configure your Extron MTPX Plus Twisted Pair (TP) Matrix Switcher. Step by step instructions show you how to connect the hardware, and then use the physical controls and the Matrix Switchers Control Program to optimize the video and audio output for the best quality.

About the MTPX Plus Switchers

The MTPX Plus matrix switcher (figure 1-1) distributes signals that are compatible with the Extron MTP and VTT/VTR product lines. The matrix switcher routes a TP input signal to any combination of TP outputs. Depending on the MTP model, the routed TP signal can include RGB or low resolution video and either mono audio or transmitter-to-receiver RS-232 serial communications. The matrix switcher can route multiple input/output configurations simultaneously.

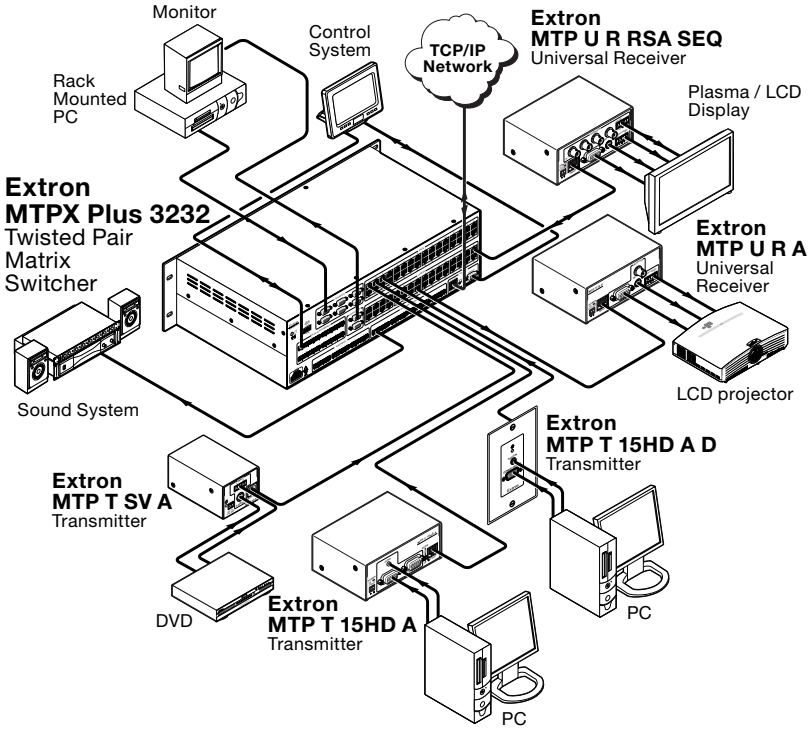


Figure 1-1 — Typical MTPX Plus Twisted Pair Matrix Switcher application

NOTE *The receiver-to-transmitter serial communications and remote power capabilities available with certain MTP models are not supported by this matrix switcher.*

The MTPX Plus matrix switcher is available in the following matrix sizes:

- MTPX Plus 816 (8 inputs by 16 outputs)
- MTPX Plus 168 (16 inputs by 8 outputs)
- MTPX Plus 1616 (16 inputs by 16 outputs)
- MTPX Plus 1632 (16 inputs by 32 outputs)
- MTPX Plus 3216 (32 inputs by 16 outputs)
- MTPX Plus 3232 (32 inputs by 32 outputs)

The MTPX Plus switchers input and output TP signals on RJ-45 connectors.

NOTE *For best results, use a cable length of at least 50' (15 m) between the TP inputs and outputs and the transmitter and receiver.*

Three or six (depending on the matrix size) 15-pin HD and 5-pole 3.5 mm direct insertion input connectors are available for direct RGB (VGA) and stereo audio inputs without an MTP transmitter.

One or two (depending on the matrix size) 15-pin HD output connectors are available for direct RGB (VGA) output to a video device without an MTP receiver.

NOTE *The direct input and direct output 15-pin HD connectors can also support HD-YUV video, YUV video, S-video, and composite video.*

Four or eight (depending on the matrix size) 5-pole 3.5 mm captive screw ports are available for direct mono audio outputs to an audio device without an MTP transmitter.

NOTE *For low resolution MTPs (S-video and composite video) on the TP inputs and outputs, the MTPX Plus audio circuits are compatible only with the newer generation, mono audio models. See the MTP transmitter/ receiver to determine which MTP models you have.*

Four, eight, or 16 (depending on the matrix size) 3-pole 3.5 mm captive screw ports are available for bidirectional RS-232 signals from a dedicated source (rather than from the selected input) to be directly inserted into the signal set routed to the TP output.

The matrix switcher can be remotely controlled via its Ethernet LAN port or either of two serial ports using either Extron's Windows®-based Matrix Switchers Control Program or the Simple Instruction Set (SIS™).

Twisted Pair (TP) Cable Transmission Distance

CAUTION *Do not connect this device to a computer data or telecommunications network.*

The maximum distance is determined by the frequency and resolution of the signal that is input to the transmitter or to one of the matrix switcher's local inputs. The table below specifies the recommended maximum transmission distances using Extron Enhanced Skew-Free A/V UTP cable or UTP CAT 5, 5e, or 6 cable, terminated with RJ-45 connectors.

Recommended transmission distances at 60 Hz

Video format	High quality transmission maximum distance		Variable quality transmission maximum distance	
	MTPX input	MTPX output	MTPX input	MTPX output
Composite, S-video, Component	700' (215 m)	700' (215 m)	750' (230 m)	750' (230 m)
640 x 480	550' (165 m)	600' (185 m)	550' (168 m)	700' (215 m)
800 x 600	500' (150 m)	500' (150 m)	600' (185 m)	600' (185 m)
1024 x 768	450' (135 m)	450' (135 m)	550' (168 m)	550' (168 m)
1280 x 1024	350' (100 m)	350' (100 m)	450' (135 m)	450' (135 m)
1600 x 1200	300' (90 m)	300' (90 m)	450' (135 m)	450' (135 m)

For any transmission distances above 350' (100 m), turn on the transmitting device's (MTP transmitter or MTPX Plus) pre-peak function. See the *MTP Transmitter/Receiver User's Manual* and/or the `Output pre-peaking` SIS commands on page 4-8.

NOTE *The minimum TP cable length should be 50' (15m).*

NOTE *It is possible to exceed the recommended distance; however, image quality may be reduced.*

NOTE *The MTPX output can be extended by 50 feet (15 m) for those outputs that have a Pre-Peak feature that is turned on.*

NOTE *The transmitters, receivers, and matrix switcher are designed for and perform best with Extron Enhanced Skew-Free A/V cable terminated in accordance with the TIA/EIA T 568 A wiring standard. CAT 5, 5e, and 6 cables are acceptable, but less preferable. We also recommend the use of preterminated and tested cables. Cables terminated on site should be tested before use to ensure that they comply with Category 5 specifications.*

NOTE *The recommendations shown on the preceeding page apply equally for a transmission line consisting of a single transmitter, the switcher, and receiver; and for a transmision line that encompass a transmission daisy chain. For example, the maximum suggested range for 1024 x 768 video output by the switcher is 550' (168 m) with Pre-Peak on whether the transmission line consists of the transmitter, switcher, and a single receiver or a transmitter, the switcher, and three daisy-chained receivers.*

NOTE *For daisy-chained units, the first receiver in the chain should be at least 50' (15 m) from the switcher when the Pre-Peak feature is on.*

NOTE *For daisy-chained units, any receiver in the chain closer than 350' (105 m) may experience some form of over-peaking when the Pre-Peak switch is on.*

TP Skew Equalization

Skew exists between wire pairs when the physical length of one wire pair is different from another. Skew affects the displayed image when the differential length between wire pairs exceeds 2 feet, causing the timing of the red, green, and blue video signals to appear out of alignment (horizontal registration errors). The signals transmitted on the shortest pair are shifted to the left if you are using white lines on a black background. A white vertical line on a black field can appear as individual red, green, and blue lines that are close together; the signal transmitted on the shortest wire pair leads the other colors and appears to the left on the display. As the transmission cable length increases, the skew effect increases.

The MTPX Plus's input and output skew equalizer functions provide separate time delay circuits on the red, green, and blue video lines. This allows you to properly align the red, green, and blue video signals on the displayed image. When correctly set, the red, green, or blue video signal on the shortest wire pair is delayed to properly converge the displayed video image.

UTP cable test equipment measures and reports wire pair length. The report on the various pair lengths can be used to properly equalize pair skew. If UTP cable test measurement cannot be done, pair skew can still be equalized by viewing a crosshatch test pattern with a critical eye.

Chapter Two

Installation

Rear Panel

Front Panel

Rear Panel

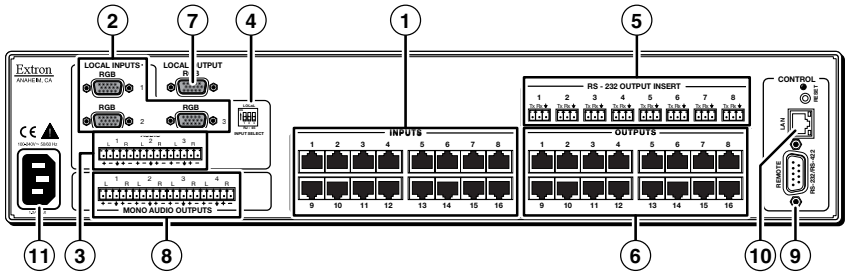


Figure 2-1 — MTPX Plus 1616 rear panel

NOTE *The MTPX Plus 816 and MTPX Plus 168 are housed in the same 2U enclosure as the MTPX Plus 1616, but have fewer input and/or output connectors to accommodate their smaller matrix sizes.*

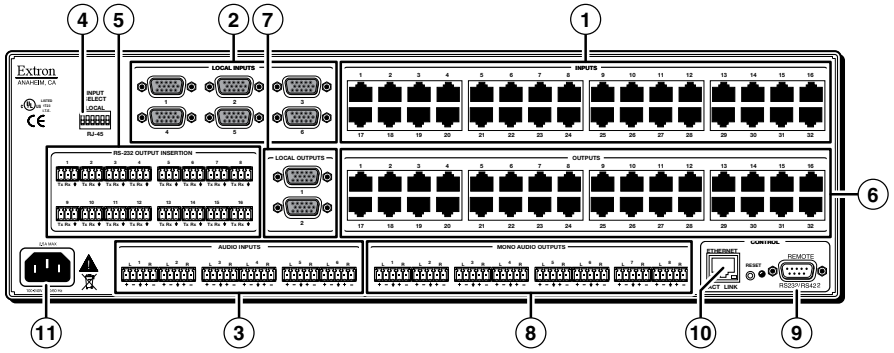


Figure 2-2 — MTPX Plus 3232 rear panel

NOTE *The MTPX Plus 1632 and MTPX Plus 3216 are housed in the same 3U enclosure as the MTPX 3232, but have fewer input and/or output connectors to accommodate their smaller matrix sizes.*

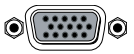
Inputs

CAUTION *Turn off power to the input and output devices, and disconnect their power cords.*

① **TP inputs —** Connect up to 8, 16, or 32 (depending on the matrix size) compatible TP inputs to the Inputs RJ-45 connectors.

NOTE *You must configure the switcher for the appropriate input (RS-232 or audio) for each TP input. See "Defining the Audio/RS-232 Wire Pair (and Configuring the Remote Port)" on page 3-6.*

② **Local RGB (VGA) inputs —** Connect analog computer-video sources to the Local Inputs 15-pin HD female connectors.



NOTE *These connectors can also accept HD component video, component video, S-video, or composite video.*

③ **Local audio inputs —** Connect balanced or unbalanced stereo audio inputs to the Audio 5-pole captive screw connectors.

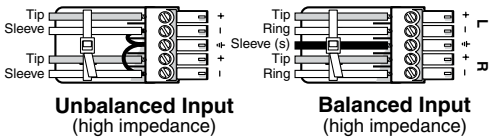
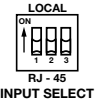


Figure 2-3 — Audio input connector wiring

④ **Input Select switches —** Set the Input Select DIP switches for each input that can be either local or on TP cable from an MTP transmitter.



RJ-45 (down) for an input from an MTP transmitter (①)

Local (up) for a local (RGB video and audio) input (② and ③)

NOTE *MTPX Plus 1616 and smaller have Input Select DIP switches for inputs 1 through 3.*

MTPX Plus 1632 and larger have Input Select DIP switches for inputs 1 through 6.

RS-232 output inserts

⑤ **RS-232 Output Insert connectors —** For bidirectional RS-232 data that is routed to a specific (unswitchable) TP output, connect a serial device to one of the RS-232 Output Insert 3-pole captive screw connectors.

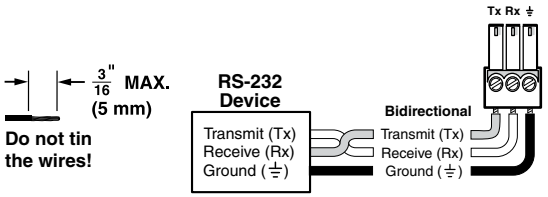


Figure 2-4 — RS-232 output inserts connector wiring

NOTE *For the RS-232 Output Insert to be available on the TP output, it must be enabled. See the* `RS-232 output inserts enables` *SIS commands on page 4-5.*

NOTE *The switch time for the RS-232 output insert is 50 ms.*

Outputs

⑥ **TP outputs —** Connect up to 8, 16, or 32 (depending on the matrix size) compatible MTP receivers to the Outputs RJ-45 connectors.

⑦ **Local RGB (VGA) outputs —** Connect one or two RGBHV video displays to the Local Outputs (VGA) 15-pin HD female connectors.

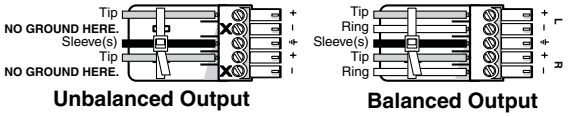
NOTE *These outputs are always outputs 1 and 2.*

NOTE *The video that is output on this (these) connector(s) is converted from the tied proprietary TP input signal or the local (VGA) input.*

NOTE *This connector can also output HD component video, component video, S-video, or composite video if that is the video format that was input.*

If the video output is NTSC component video, S-video, or composite video, set the output to turn off sync stripping. See the `Local video output sync polarity` *SIS commands on page 4-9.*

⑧ **Local audio outputs —** Connect audio devices, such as audio amplifiers or powered speakers to these four or eight 3.5 mm, Mono Audio (local audio) outputs 5-pole captive screw connectors to receive unamplified, mono line level audio.



CAUTION *Connect the sleeve to ground. Connecting the sleeve to a negative (-) terminal will damage the audio output circuits.*

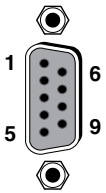
Figure 2-5 — Audio output connector wiring

NOTE *These outputs are always outputs 1 through 4 (matrix sizes up to 1616) or outputs 1 through 8 (matrix sizes 1632 and larger), with the same inputstied to them as to TP outputs 1 through 4 (8).*

NOTE *Each local output has a volume control. See "Viewing and Adjusting the Audio Level" on page 3-7.*

Remote control

⑨ **Remote port —** If desired, connect a control system or computer to the rear panel Remote RS-232/RS-422 port.



Pin	RS-232	Function	RS-422	Function
1	—	Not used	—	Not used
2	TX	Transmit	TX–	Transmit (–)
3	RX	Receive	RX–	Receive (–)
4	—	Not used	—	Not used
5	Gnd	Ground	Gnd	Ground
6	—	Not used	—	Not used
7	—	Not used	RX+	Receive (+)
8	—	Not used	TX+	Transmit (+)
9	—	Not used	—	Not used

Figure 2-6 — Remote port connector wiring

⑩ **Ethernet port —** If desired, connect a network WAN or LAN hub, a control system, or a computer to the Ethernet RJ-45 port.

- **Network connection** — Wire as a patch (straight) cable.
- **Computer or control system connection** — Wire the interface cable as a crossover cable.

NOTE *The factory default IP address is 192.168.254.254.*

Power

⑪ **Power connector —** Plug the switcher into a grounded AC source.

Front Panel

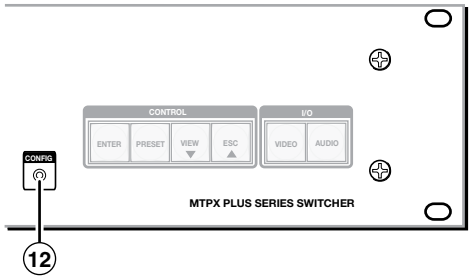


Figure 2-7 — Front panel configuration port

⑫ **Configuration port —** If desired, connect a control system or computer to the front panel Configuration (RS-232) port. Use an optional 9-pin D to 2.5 mm mini jack TRS RS-232 cable, part #**70-335-01**.

Chapter Three

Front Panel Operation

Creating a Tie

Saving or Recalling a Preset

Setting the Front Panel Locks (Executive Modes)

Defining the Audio/RS-232 Wire Pair (and Configuring the Remote Port)

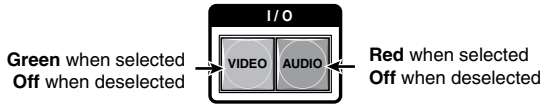
Viewing and Adjusting the Audio Level

Viewing Ties (and Muting Outputs)

Video Adjustments

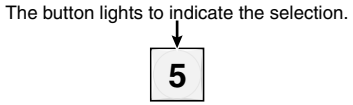
Creating a Tie

1. Press and release the Esc button to clear any input button, output button, or control button indicators that may be lit.
2. Press and release the Video and/or Audio I/O button(s) to select or deselect video and/or audio as desired.

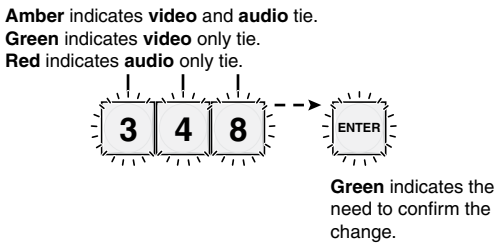


NOTE *Audio (RS-232) or video can be broken away (tied by itself) by selecting **only** the Video button or **only** the Audio button.*

3. Press and release the desired input button.



4. Press and release the desired output button(s).



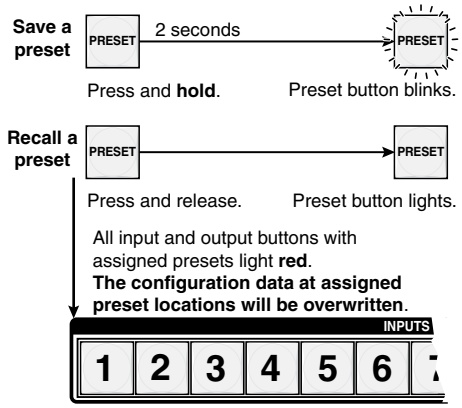
5. Press and release the Enter button. All button indicators turn off.

= lit, = blinking

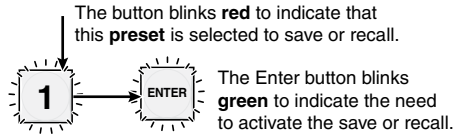
Saving or Recalling a Preset

1. **Save** a preset — Press and **hold** the Preset button until it flashes.

   Recall a preset — Press and release the Preset button.



2. Press and release the desired input or output button.


The button blinks red to indicate that this preset is selected to save or recall.
1
ENTER
The Enter button blinks green to indicate the need to activate the save or recall.

3. Press and release the Enter button.

Setting the Front Panel Locks (Executive Modes)

The matrix switcher has three levels of front panel security lock that limit the operation of the switcher from the front panel. The three levels are:

- **Lock mode 0 —** The front panel is completely unlocked.
- **Lock mode 1 —** All changes are locked from the front panel (except for setting Lock mode 2). Some functions can be viewed.
- **Lock mode 2 —** Basic functions are unlocked. Advanced features are locked and can be viewed only.

  Basic features consist of:

  - Making ties
  - Saving and recalling presets
  - Setting input audio gain and attenuation
  - Changing Lock modes

  Advanced features consist of:

  - Setting audio output mutes
  - Setting audio output volume
  - Setting audio/RS-232 wire pair (and front panel configuration)

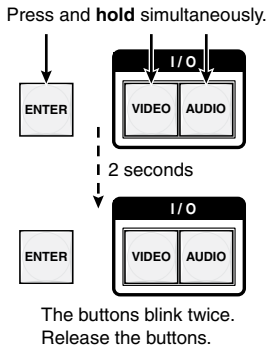
NOTE *The switcher is shipped from the factory in Lock mode 2.*

Selecting Lock mode 2 or toggling between mode 2 and mode 0

NOTE *If the switcher is in Lock mode 0 or mode 1, this procedure selects mode 2.*

If the switcher in in Lock mode 2, this procedure selects mode 0 (unlocks the switcher).

Toggle the lock on and off by pressing and holding the Enter button, the Video button, and the Audio button simultaneously for approximately 2 seconds.



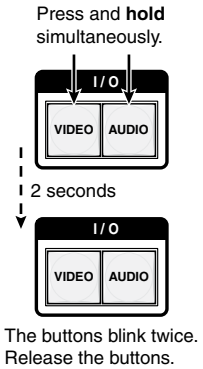
= lit, = blinking

Selecting Lock mode 2 or toggling between mode 2 and mode 1

NOTE *If the switcher is in Lock mode 0 or mode 1, this procedure selects mode 2.*

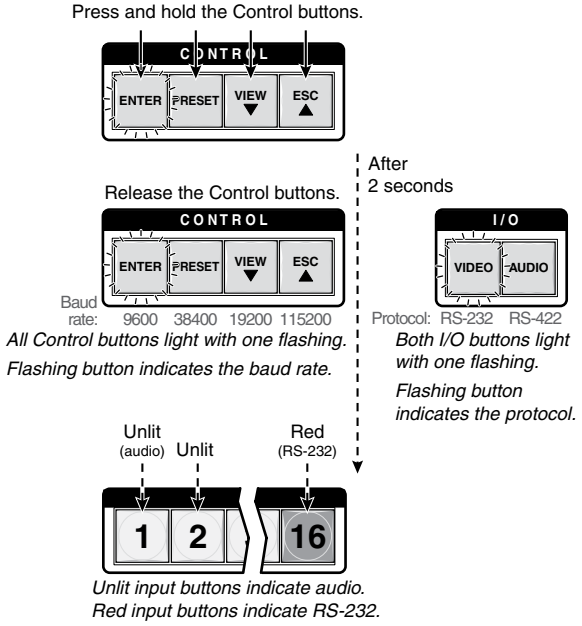
If the switcher in in Lock mode 2, this procedure selects mode 1.

Toggle the lock on and off by pressing and holding the Video button and the Audio button simultaneously for approximately 2 seconds.



Defining the Audio/RS-232 Wire Pair (and Configuring the Remote Port)

1. To enter *Configuration* mode, simultaneously press and hold the Enter, Preset, View, and Esc buttons.



NOTE *The Control and I/O buttons indicate the Remote port baud rate and protocol as shown.*

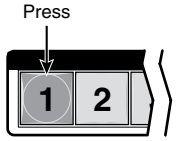
The input buttons show the audio/RS-232 wire pair configurations.

2. Release the Control buttons.

NOTE *These settings are protected when front panel Lock mode 2 is selected. You can view the configurations in Lock mode 2 but you cannot change them from the front panel; the actions are ignored and the Enter, Video, and Audio buttons flash.*
See "Selecting Lock mode 2 or toggling between mode 2 and mode 0" on page 3-4 to unlock the front panel.

□ = lit, ▣ = blinking

3. To change an input's audio/RS-232 wire pair configuration, press and release the input button to toggle that input's configuration.



Input button toggles:
Unlit --> red ***OR***
red --> unlit

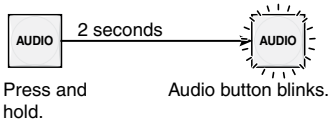
NOTE *You can also change the Remote port baud rate and/or protocol by pressing the associated Control and/or I/O buttons.*

4. Press and release an output button to exit the Serial Port Selection and Configuration mode.

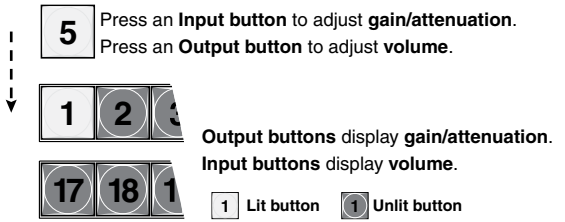
Viewing and Adjusting the Audio Level

NOTE *Only the twisted pairs' input levels and only the local outputs' volume can be adjusted.*

1. Press and **hold** the Audio button until it flashes.

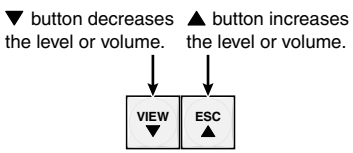


2. Press an input or output button. Refer to the *MTPX Plus User's Manual*, chapter 3, "Operation", to read the displayed value.



□ = lit, ▣ = blinking, ■ = unlit

3. Increase/decrease the level or volume by pressing the Esc (▲) and View (▼) buttons.



4. Press and release the Audio button to exit.

Viewing Ties (and Muting Outputs)

1. Press the View button. Output buttons light for outputs that have no ties established.

NOTE *If the Audio button blinks, audio is broken away (switched separately from video).*

NOTE *If an output button blinks, that output is muted.* ***To toggle mute on and off****, press and hold the output button for 2 seconds.*

2. Press an input button. The buttons for all tied outputs light (amber for video and audio, green for video only, and red for audio only).
3. Press an output button. The buttons for the tied input and all tied outputs light.
4. Press the View button. All input and output buttons return to an unlit state.

Video Adjustments

Image adjustments are available via SIS commands, the Windows-based control and configuration program, and the built-in HTML pages. See chapter 4, "Remote Control and Optimizing the Video".

= lit, = blinking

Chapter Four

Remote Control and Optimizing the Video

Selected SIS™ Commands

Installing and Starting the Control Program

Accessing the HTML Pages

Selected SIS™ Commands

The switchers have Simple Instruction Set (SIS™) commands that you can use for operation and configuration. You can run these commands from a PC connected to either of the switcher's serial ports or the Ethernet port. See ⑨, ⑩, and ⑫, on pages 2-5 and 2-6, for connection information.

Establishing a network (Ethernet) connection

Establish a network connection as follows:

1. Open a TCP socket to port 23 using the switcher's IP address.

   NOTE *The factory default IP address is 192.168.254.254.*

   The switcher responds with a copyright message including the date, the name of the product, firmware version, part number, and the current date/time.

   NOTE *If the switcher is not password-protected, the device is now ready to accept SIS commands.*

   NOTE *If the switcher is password-protected, a* `password` *prompt appears.*

2. If the switcher is password-protected, enter the appropriate password.

   If the password is accepted, the switcher responds with *`Login User`* or *`Login Administrator`*.

   If the password is not accepted, the *`Password`* prompt reappears.

Connection timeouts

The Ethernet link times out and disconnects after a designated period of time of no communications. By default, this timeout value is set to five minutes but the value can be changed. See the `Configure port timeout` SIS commands on page 4-14.

NOTE *Extron recommends leaving the default timeout at 5 minutes and periodically issuing the Query (Q) command to keep the connection active or disconnecting the socket and reopening the connection when necessary.*

Number of connections

A switcher can have up to 200 simultaneous TCP connections, including all HTTP sockets and Telnet connections. When the connection limit is reached, the switcher accepts no new connections until some have been closed. No error message or indication is given that the connection limit has been reached. To maximize performance of your switcher, the number of connections should stay low and unnecessary open sockets should be closed.

Verbose mode

Telnet connections to a switcher can be used to monitor for changes that occur on the switcher, such as front panel operations and SIS commands from other Telnet sockets or a serial port. For a Telnet session to receive change notices from the switcher, the Telnet session must be in verbose mode 3. See the `Set verbose mode` command on page 4-14. In verbose mode 3, the Telnet socket reports changes in messages that resemble SIS command responses.

Host-to-switcher instructions

The switcher accepts SIS commands through either serial port. SIS commands consist of one or more characters per command field. They do not require any special characters to begin or end the command character sequence. Each switcher response to an SIS command ends with a carriage return and a line feed (CR/LF = ↵), which signals the end of the response character string. A string is one or more characters.

NOTE *The table that begins on the next page is a partial list of SIS commands. For a complete listing, refer to the* MTPX Plus User's Manual.

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Create ties			
NOTE • *Commands can be entered back-to-back in a string, with no spaces. For example: 1*1!02*02&003*003%4*24$.*			
• *The matrix switchers support 1-, 2-, and 3-digit numeric entries (1*1!, 02*02&, or 003*003%).*			
NOTE *The & **tie** command for RGB and the % **tie** command for video can be used interchangeably.*			
NOTE *The & **read tie** command for RGB and the % **read tie** command for video can be used interchangeably.*			
Tie input X1 to output X2, video and audio	X1*X2!	OutX2•InX1•All↵	Tie input X1's video and audio to output X2.
Example:	1*3!	Out03•In01•All↵	Tie input 1 video and audio to output 3.
Tie input X1 to output X2, RGBHV only	X1*X2&	OutX2•InX1•RGB↵	Audio breakaway.
Example (see 2nd Note, above):	10*4&	Out04•In10•RGB↵	Tie input 10 RGB to output 4.
Tie input X1 to output X2, video only	X1*X2%	OutX2•InX1•Vid↵	Audio breakaway.
Example (see 2nd Note, above)	7*5%	Out05•In07•Vid↵	Tie input 7 video to output 5.
Tie input X1 to output X2, audio only	X1*X2$	OutX2•InX1•Aud↵	Audio breakaway.
Example:	24*04$	Out04•In24•Aud↵	Tie input 24 audio to output 4.
Read RGB output tie	X2&	X1↵	RGBHV input X1 is tied to output X2.
Read video output tie	X2%	X1↵	Video input X1 is tied to output X2.
Read audio output tie	X2$	X1↵	Audio input X1 is tied to output X2.

NOTE

X1 = Input number — 00 – (maximum number of inputs for your model) (00 = untied)
X2 = Output number — 01 – (maximum number of outputs for your model)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Audio/RS-232 TP input (wire pair 3 and 6) configuration			
NOTE *The RS-232 output insert ports, when enabled (Esc X4*0Lrpt↵), override the audio/RS-232 TP input configurations.*			
Configure input as audio	X1*0\	TypX1*0↵	Define the audio/RS-232 input as audio, such as provided by an MTP 15HD A transmitter.
Configure input as RS-232	X1*1\	TypX1*1↵	Define the audio/RS-232 input as bi-directional serial communications, such as provided by an MTP 15HD RS transmitter.
Read TP input configuration	X1\	X3↵	Show the audio/RS-232 wire pair input definition.
RS-232 output inserts enables			
Disable an RS-232 output insert port	Esc X4*0Lrpt↵	LrptX4*0↵	Disable the RS-232 insert on the X4 output.
Enable an RS-232 output insert port	Esc X4*1Lrpt↵	LrptX4*1↵	Enable the RS-232 insert on the X4 output.
Read RS-232 output insert status	Esc X4Lrpt↵	X5↵	Show the status of the RS-232 output insert.

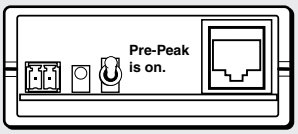
NOTE

X1 = Input number — 01 – (maximum number of inputs for your model)
X3 = Audio/RS-232 wire pair input type — 0 = audio; 1 = RS-232
X4 = RS-232 output insert port — MTPX Plus 168, 816, 1616: 01 – 08; MTPX Plus 1632, 3216, 3232: 01 – 16
X5 = RS-232 output insert status — 0 = disabled; 1 = enabled

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Input signal level/peaking and auto calibrate			
Set input signal level	Esc X1 * X6 Ipek ←	Ipek X1 * X6 ↵	Set a specific pre-peak level for the TP input.
Increment input peaking	Esc X1 +Ipek ←	Ipek X1 * X6 ↵	Increase the input pre-peaking level by 1.
Decrement input peaking	Esc X1 -Ipek ←	Ipek X1 * X6 ↵	Decrease the pre-peaking level by 1.
Read input peaking setting	Esc X1 Ipek ←	X6 ↵	
Execute auto calibration	Esc X1 *0AADJ ←	Aadj X1 *2 ↵ *{start}* Qik ↵ *{tie creation}* Aadj X1 * X7 ↵ *{finished}* Ipek X1 * X6 ↵ *{new value}*	Tie input X1 to output 1 and auto adjust the peaking on input X1. The X7 value in the response reports whether the adjustment value was within or outside of the threshold.

NOTE *Before issuing the auto calibration command:*

1. *Disconnect the power and RJ-45 cables at the MTP transmitter connected to* X1.
2. *Connect the two cables to the included MTP signal generator.*
3. *If the input cable is longer than 300' (90 m), place the MTP signal generator's Pre-Peak switch on (up when the signal generator's RJ-45 connector is to the right as shown at right).*



NOTE

X1 = Input number	01 – (maximum number of inputs for your model)
X6 = Input signal level/peaking range	000 – 255
X7 = Threshold	0 = outside of threshold 1 = within threshold

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Input skew adjustment			
Set all input skew adjustment values	Esc X1 * X8 * X8 * X8 Iseq ←	Iseq X1 * X8 * X8 * X8 ↵	Set a specific skew adjustment for the TP input. X8 values are listed in RGB order.
Example:	Esc 2*0*0*4Iseq ←	Iseq02*0*0*4 ↵	Set input 2's skew settings as follows: Red = 0 ns Green = 0 ns Blue = 8 ns (delayed 8 ns)
Increment one input skew adjustment value	Esc X1 * X9 +Iseq ←	Iseq X1 * X8 * X8 * X8 ↵	Increase input X1's X9 plane's skew adjustment by 1 step (2 ns).
Example:	Esc 2*2*+Iseq ←	Iseq02*0*0*5 ↵	Increase input 2's blue skew by 2 ns to 10 ns.
Decrement one input skew adjustment value	Esc X1 * X9 -Iseq ←	Iseq X1 * X8 * X8 * X8 ↵	Decrease input X1's X9 plane's skew adjustment by 1 step (2 ns).
Read input skew adjustment values	Esc X1 Iseq ←	X8 * X8 * X8 ↵	

NOTE

X1 = Input number	01 – (maximum number of inputs for your model)
X8 = Skew adjustment range	00 – 31 (each step = 2ns)
X9 = Video plane	0 = red 1 = green 2 = blue

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Output skew adjustment			
Set all output skew adjustment values	Esc X2*X8*X8*X8Oseq↵	OseqX2*X8*X8*X8↵	Set a specific skew adjustment for the TP output. X8 values are listed in RGB order.
Example:	Esc2*0*0*4Oseq↵	Oseq02*0*0*4↵	Set output 2's skew settings as follows: Red = 0 ns Green = 0 ns Blue = 8 ns (delayed 8 ns).
Increment one output skew adjustment value	Esc X2*X9+Oseq↵	OseqX2*X8*X8*X8↵	Increase output X2's X9 plane's skew adjustment by 1 step (2 ns).
Decrement one output skew adjustment value	Esc X2*X9-Oseq↵	OseqX2*X8*X8*X8↵	Decrease output X2's X9 plane's skew adjustment by 1 step (2 ns).
Example:	Esc2*2*-Oseq↵	Oseq02*0*0*3↵	Decrease output 2's blue skew by 2 ns to 6 ns.
Read output skew adjustment values	Esc X2Oseq↵	X8*X8*X8↵	
Output pre-peaking			
Set output pre-peaking on	Esc X10*1Opek↵	OpekX10*1↵	Pre-peak the TP output.
Set output pre-peaking off	Esc X10*0Opek↵	OpekX10*0↵	Do not pre-peak the TP output.
Read output pre-peaking setting	Esc X10Opek↵	X11↵	

NOTE

X2	= Output number	01 – (maximum number of inputs for your model)
X8	= Skew adjustment range	00 – 31 (each step = 2ns)
X9	= Video plane	0 = red, 1 = green, 2 = blue
X10	= Pre-peakable output number	01 – half of your matrix switcher's outputs (such as 04 for MTPX Plus 168)
X11	= Pre-peaking	0 = off 1 = on

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Local video output sync polarity			
NOTE *The command structure differs, depending on the size of the matrix. Matrix sizes 1616 and smaller do not need the local output variable (X13). Matrix sizes 1632 and larger require the variable.*			
Set local output polarity (matrix size 1616 and smaller)	Esc X12Opol↵	OpolX12↵	Set the horizontal and vertical sync polarity for a local output.
Example:	Esc0Opol↵	Opol00↵	Set the local output to output negative horizontal and vertical sync.
Set local output polarity (matrix size 1632 and larger)	Esc X13*X12Opol↵	OpolX13*X12↵	Set the horizontal and vertical sync polarity for local output X13.
Example:	Esc2*0Opol↵	Opol2*00↵	Set local output 2 to output negative horizontal and vertical sync.
Read local output sync settings (matrix size 1616 and smaller)	EscOpol↵	X12↵	
Read local output sync settings (matrix size 1632 and larger)	Esc X13Opol↵	X12↵	

NOTE

X12	= Local output sync polarity	0 = H- / V- (default) 1 = H+ / V- 2 = H- / V+ 3 = H+ / V+ 4 = NTSC (no sync stripping)
X13	= Local video output number	1 (matrix sizes 1616 and smaller) 1 or 2 (matrix sizes 1632 and larger)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Audio or RS-232 mute commands			
Audio or RS-232 mute	X2*1Z	AmtX2*1↵	Mute output X2 audio (audio off).
Audio or RS-232 unmute	X2*0Z	AmtX2*0↵	Unmute output X2 audio (audio on).
Read audio or RS-232 mute	X2Z	X14↵	1 = mute on, 0 = mute off.
Global audio or RS-232 mute	1*Z	Amt1↵	Mute all audio outputs.
Global audio or RS-232 unmute	0*Z	Amt0↵	Unmute all audio outputs.
View output mutes	EscVM←	X15[1], X15[2], ... X15[n]↵	Each X15 response is the mute status of an output, starting from output 1. *n* = the maximum number of outputs for this model.
*Example: **MTPX Plus 3216***	EscVM←	Mut0220200002202000↵	Output 2, 3, 5, 10, 11, and 13 audio or RS-232 are muted. All other outputs are unmuted.

NOTE *The "Mut" portion of the response appears only when the switcher is in Verbose mode 3. See the Verbose mode command on page 4-14.*

NOTE

X2 = Output number	01 – (maximum number of outputs for your model)
X14 = Mute	0 = off (unmuted) 1 = on (muted)
X15 = Audio or RS-232 mute:	0 = no mutes 2 = audio or RS-232 mute

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Audio input gain and attenuation			
NOTE *The set gain (**G**) and set attenuation (**g**) commands **are** case sensitive.*			
Set input audio gain to +dB value	X1*X16G	InX1•AudX17↵	
Example:	1*2G	In01•Aud+02↵	Set input 1 audio gain to +2 dB.
Set input audio attenuation to -dB value	X1*X18g	InX1•AudX17↵	
Increment gain	X1+G	InX1•AudX17↵	Increase gain by 1 dB.
Example:	5+G	In05•Aud+03↵	Increase audio input 5 level from +2 dB to +3 dB.
Decrement gain	X1-G	InX1•AudX17↵	Decrease gain by 1 dB.
Example:	7-G	In07•Aud-09↵	Decrease audio input 7 level from -8 dB to -9 dB.
Read input level	X1G	X17↵	

NOTE

X1 = Input number	01 – (maximum number of inputs for your model)
X16 = Audio gain	0 – 24 (1 dB/step)
X17 = Numeric dB value	–18 to +24 (45 steps of gain or attenuation) (Default = 0 dB)
X18 = Audio attenuation	1 – 18 (1 dB/step)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
Audio output volume			
Set the audio volume to a specific value	X2*X19V	OutX2•VolX19↵	
Example:	1*50v	Out01•Vol50↵	Set output 1 volume to 79%.
Increment volume	X2+V	OutX2•VolX19↵	Increase volume by 1 step.
Example:	1+V	Out01•Vol51↵	
Decrement volume	X2-V	OutX2•VolX19↵	Decrease volume by 1 step.
Read output volume	X2V	X19↵	
Save and recall presets			
NOTE *If you try to recall a preset that is not saved, the matrix switcher responds with the error code E11.*			
Save current configuration as a global preset	X20,	SprX20↵	Command character is a comma.
Example:	9,	Spr09↵	Save current ties as preset 9.
Recall a global preset	X20.	RprX20↵	Command character is a period.
Example:	5.	Rpr05↵	Recall preset 5, which becomes the current configuration.

NOTE
X2 = Output number — 01 – (maximum number of outputs for your model)
X19 = Volume adjustment range — 0 – 64 (1 dB/step except for 0-to-1, which is 22 dB) (default = 64 [0 dB])
X20 = Global or room preset # — 0 - 32

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
***Lock* (executive) modes**			
NOTE *See "Setting the front panel locks (Executive modes)" on page 3-4 for more information on the Lock modes.*			
Lock all front panel functions	1X	Exe1↵	Enable Lock mode 1.
Lock advanced front panel functions	2X	Exe2↵	Enable Lock mode 2.
Unlock all front panel functions	0X	Exe0↵	Enable Lock mode 0.
View lock status	X	X21↵	
Information requests			
Information request	I	VX22XX23•AX22XX23↵	VX22XX23 is the video matrix size.
*Example: **MTPX Plus 3216***	I	V32X16•A32X16↵	AX22XX23 is the audio matrix size.
Request part number	N	X24↵	
Query controller firmware version	Q	X25↵	
Example:	Q	1.23↵	The factory-installed controller firmware version is 1.23 (sample value only).

NOTE
X21 = Lock mode — 0, 1, or 2
X22 = Inputs — Total number of inputs for this switcher
X23 = Outputs — Total number of outputs for this switcher
X24 = Part number
X25 = Firmware version number to second decimal place (*x.xx*)

Command	ASCII command (host to switcher)	Response (switcher to host)	Additional description
IP setup			
Set IP address	Esc X26 CI ←	Ipi X26 ↵	
Read IP address	Esc CI ←	X26 ↵	
Set subnet mask	Esc X26 CS ←	Ips X26 ↵	
Read subnet mask	Esc CS ←	X26 ↵	
Set gateway IP address	Esc X26 CG ←	Ipg X26 ↵	
Read gateway IP address	Esc CG ←	X26 ↵	
Set DHCP on or off	Esc X27 DH ←	Idh X27 ↵	
Read DHCP on/off status	Esc DH ←	X27 ↵	
Set verbose mode	Esc X28 CV ←	Vrb X28 ↵	
Read verbose mode	Esc CV ←	X28 ↵	
Configure current port timeout	Esc 0* X29 TC ←	Pti0* X29 ↵	
Read current port timeout	Esc 0TC ←	X29 ↵	
Configure global IP port timeout	Esc 1* X29 TC ←	Pti1* X29 ↵	
Read global IP port timeout	Esc 1TC ←	X29 ↵	

NOTE

X26 = IP address	###.###.###.###
X27 = DHCP	0 =1 off, 1 = on
X28 = Verbose mode	0 = clear/none (default for Telnet connection) 1 = verbose mode (default for RS-232/RS-422 connection) 2 = tagged responses for queries 3 = verbose mode and tagged for queries
X29 = Port timeout interval	1 (= 10 seconds) - 65000 (default is 30 = 300 seconds = 5 minutes)

Installing and Starting the Control Program

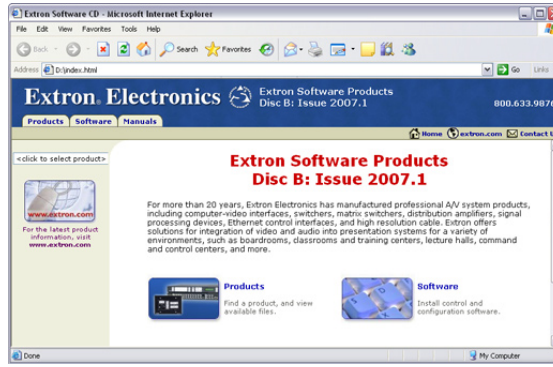
Another way to operate the switcher, to set the skew adjustments, the level and peaking, and the output pre-peaking (see "Optimizing the video", beginning on page 4-17), is via the Windows®-based Matrix Switchers Control Program. This program is contained on the Extron Software Products CD-ROM (included with the switcher). Run this program on a PC connected to either of the switcher's serial ports or the Ethernet port. See ⑨, ⑩, and ⑫, on pages 2-5 and 2-6, for connection information. The program must be installed on a Windows-based computer and cannot be run from the CD-ROM.

NOTE *For details on operating the program, refer to the* MTPX Plus User's Manual, *chapter 5, "Matrix Software".*

Installing the program

1. Insert the CD-ROM into the drive. The installation program should start automatically.

   The Extron software CD window appears.


Extron Software CD - Microsoft Internet Explorer
Extron Electronics
Extron Software Products
Disc B: Issue 2007.1
800.633.9876
Products
Software
Manuals
<click to select product>
Extron Software Products
Disc B: Issue 2007.1
For more than 20 years, Extron Electronics has manufactured professional A/V system products, including computer-video interfaces, switchers, matrix switchers, distribution amplifiers, signal processing devices, Ethernet control interfaces, and high resolution cable. Extron offers solutions for integration of video and audio into presentation systems for a variety of environments, such as boardrooms, classrooms and training centers, lecture halls, command and control centers, and more.
Products
Find a product, and view available files.
Software
Install control and configuration software.

NOTE *If the installation program does not self-start, run Launch.exe from the CD.*

2. Click the **Software** tab.

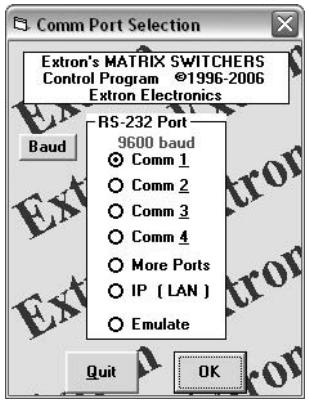
3. Scroll to the Matrix Switchers program and click **Install**.

4. Follow the on-screen instructions. The installation program creates a C:\Program Files\Extron\Matrix_Switchers directory and an "Extron Electronics\Matrix Switchers" group folder. It installs the following four programs:
   - MATRIX Switcher+ Control Program
   - MATRIX Switcher+ Help
   - Uninstall MATRIX Switcher
   - Check for Matrix Updates

Starting the program

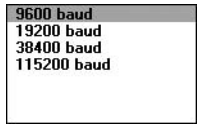
1. Click **Start** > **Programs** > **Extron Electronics** > **Matrix Switchers** > **MATRIX Switcher + Control Pgm**.

   The Comm Port Selection window appears.



2. Choose the comm (serial) port that is connected to the switcher or **IP [LAN]**.

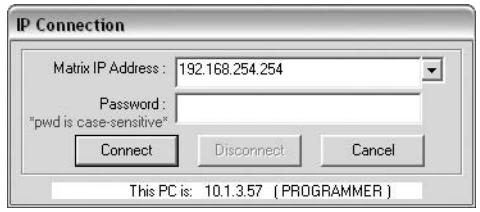
NOTE **For a comm port**, *check the baud rate displayed in the comm port selection window. If you need to change the baud rate, click the* **Baud** *button and double-click the desired baud rate.*



   Click **OK**.

   If you selected a serial port in step 2, the Matrix Switchers Control Program is ready for operation.

3. **If you selected IP [LAN] in step 2**, the IP Connection window appears.



   a. Examine the Matrix IP Address field, which displays the last Matrix IP address entered.

      If necessary, enter the correct IP address in the field.

NOTE *192.168.254.254 is the factory-specified default value for this field.*

   b. If the switcher is password protected, enter the appropriate administrator or user password in the Password field.

   c. Click **Connect**. The Matrix Switchers Control Program is ready for operation.

Optimizing the video

Each TP input has a level and peaking adjustment. Most MTP transmitters and half of the MTPX Plus TP outputs have a pre-peaking feature. TP inputs and outputs have skew adjustments. See the following sections to set these adjustable features.

NOTE *Unless the TP cables are changed, these adjustments should need to be made only once, during installation.*

Before you start optimizing, set all input level and peaking, input and output skew, and ouput pre-peak settings to either zero or off

Setting the MTP transmitter Pre-Peak feature

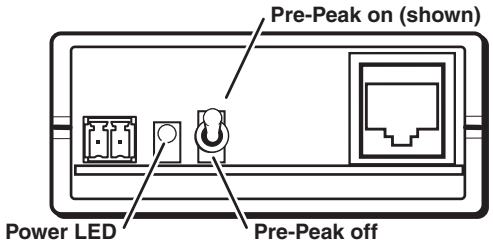
For inputs from MTP T 15HD products *only* — If the cable between the MTP transmitter and the MTPX Plus is ≥ 300', turn the transmitter's Pre-Peak switch on. For shorter cables, turn the switch off.

Setting MTPX level/peaking

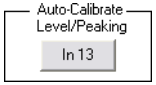
The simplest and surest way to set the input level/peaking is to use the included MTP signal generator and the Auto-calibration utility within the Matrix Switchers Control Program as follows:

NOTE *To manually set the input level/peaking, proceed to step 7.*

1. Disconnect the power and RJ-45 cables at the MTP transmitter connected to the MTPX Plus input to be adjusted.
2. Connect the two cables to the included MTP signal generator.
3. If the input cable between the transmitter and the MTPX Plus is longer than 300' (90 m), place the MTP signal generator's Pre-Peak switch on (up).



4. In the Matrix Switchers Control Program, click **Tools** > **MTPX Picture settings** and then click the **Auto-Calibrate Level/Peaking** button.



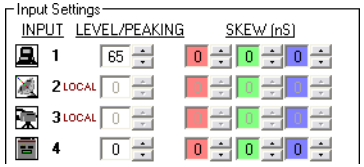
   After a few moments, the program reports whether or not the calibration succeeded and the original and new settings for the input level/peaking adjustment.
5. Disconnect the power and RJ-45 cables from the MTP signal generator and reconnect them to the MTP transmitter.
6. Repeat steps **1** through **5** for each MTPX Plus input.

   If, for any reason, you choose **not** to auto calibrate, or if you want to fine tune the adjustment, you can manually set the values as follows:
7. Connect an oscilloscope (preferred) or a monitor (acceptable) to local output (VGA ouptut) 1.
8. **If using an oscilloscope**, apply a white field test pattern to the input to be optimized via an MTP transmitter.

   If using a monitor, apply a grayscale or Color Bars test pattern to the input to be optimized via an MTP transmitter.

HINT *The Extron VTG 300 or VTG 400 are recommended to provide the test pattern.*

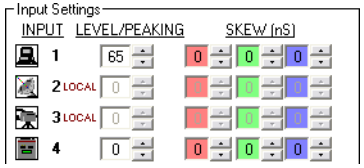
9. Tie the input to be optimized to output 1.
10. Click **Tools** > **MTPX Picture settings.**



11. Observe the oscilloscope or the monitor with a critical eye while you adjust the input level/peaking setting to compensate for signal loss between the transmitter and the MTPX.
12. If necessary, repeat steps **7** through **11** for each input.

Setting MTPX skew

1. Connect an oscilloscope (preferred) or a monitor (acceptable) to local output (VGA output) 1.
2. Apply a crosshatch test pattern to the input to be optimized via an MTP transmitter.
3. Tie the input to be optimized to output 1.
4. Use the test equipment or examine the displayed video image with a critical eye to determine which video signal — red, green, or blue — is most shifted to the left.
5. If necessary, click **Tools** > **MTPX Picture settings.**
6. Adjust the skew setting of the leftmost video signal to the right until all three colors are properly converged.

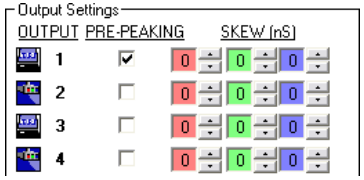


NOTE *When the skew adjustment is set to zero, the MTPX Plus cannot shift the rightmost video image to the left.*

NOTE *A 2-nanosecond adjustment is very fine. Up to 10 nanoseconds of delay may be necessary before you detect a change in the display.*

6. Adjust the skew setting of the leftmost video signal to the right until all three colors are properly converged.
7. If either of the two remaining colors is left shifted, repeat steps **4** and **6**.
8. Repeat steps **2** through **7** for all other inputs.
9. Connect an oscilloscope (preferred) or a monitor (acceptable) to the MTPX twisted pair output to be adjusted, via an MTP receiver.
10. Apply a crosshatch test pattern to one of the local (VGA) inputs on the MTPX Plus.
11. Tie the local input receiving the test pattern signal to the output to be optimized.
12. Use the test equipment or examine the displayed video image with a critical eye to determine which video signal — red, green, or blue — is most shifted to the left.

13. If necessary, click **Tools** > **MTPX Picture settings**.



NOTE *When the skew adjustment is set to zero, the MTPX Plus cannot shift the rightmost video image to the left.*

NOTE *A 2-nanosecond adjustment is very fine. Up to 10 nanoseconds of delay may be necessary before you detect a change in the display.*

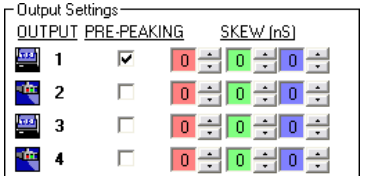
14. Adjust the leftmost video signal to the right until all three colors are converged.
15. If either of the two the remaining colors is left shifted, repeat steps **12** and **14**.
16. Repeat steps **10** through **15** for all other outputs.

Selecting MTPX Plus Pre-Peak

NOTE *MTPX Pre-Peak is available on the first half of the MTPX Plus outputs (for example outputs 1 through 4 for an MTPX Plus 168.*

NOTE *If the cable between the MTPX Plus and the receiver is > 300', turn the MTPX Plus's Pre-Peak feature on. For shorter cables, turn the feature off.*

If necessary, click **Tools** > **MTPX Picture settings** and then click in the ouput Pre-Peaking box to toggle Pre-Peaking on and off.



Setting MTP Receiver level/peaking

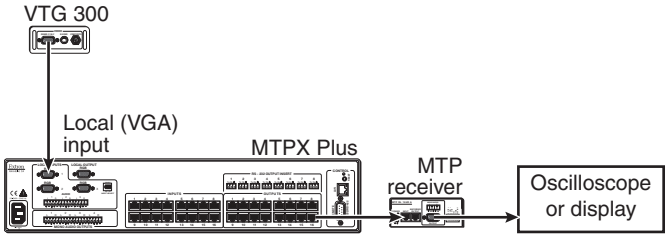
If level/peaking is available on the connected receiver(s), adjust it as follows:

1. **If using an oscilloscope**, apply a white field test pattern to one of the local (VGA) inputs on the MTPX Plus.

   If using a monitor, apply a grayscale test pattern to one of the local (VGA) inputs on the MTPX Plus.

HINT *The Extron VTG 300 or VTG 400 are recommended to provide the test pattern.*

2. Tie the local input receiving the test pattern signal to the output connected to the MTP receiver to be optimized.



3. Connect an oscilloscope or monitor to the output of the MTP receiver.
4. Adjust the receiver's level/peaking in accordance with the applicable MTP product manual.
5. Repeat steps **2** through **4** for each receiver to be optimized.

Accessing the HTML Pages

Another way to operate the switcher is via its factory-installed HTML pages, which are always available and cannot be erased or overwritten. The switcher's HTML pages are accessible through its LAN port, connected via a LAN or WAN, using a web browser such as Microsoft Internet Explorer. See ⑩ on page 2-6, for connection information.

Loading the start-up page

NOTE *If your Ethernet connection to the matrix switcher is unstable, try turning off the proxy server in your Web browser. In Microsoft Internet Explorer, click* **Tools** > **Internet Options** > **Connections** > **LAN Settings**, *uncheck the* **Use a proxy server...** *box, and then click* **OK**.

NOTE *For details on operating the switcher via HTML pages, refer to the* MTPX Plus User's Manual, *chapter 6, "HTML Operation".*

1. Start the Web browser program.
2. Click in the browser's Address field.
3. Enter the Matrix IP address in the browser's Address field.

NOTE *192.168.254.254 is the factory-specified default value for this field.*

4. Press the keyboard Enter key. The switcher checks to see if it is password protected.

   If the switcher is not password protected, it checks and downloads the HTML start-up page. The switcher is ready for operation via HTML remote control.

   If the switcher is password protected, the switcher downloads the Enter Network Password page.

NOTE *A User name entry is not required.*

5. Enter the appropriate administrator or user password in the **Password** field and click **OK**.
6. The switcher downloads the HTML start-up page. The switcher is ready for operation via HTML remote control.